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FURTHER CONSIDERATIONS OF THE
IMPLICATIVE MEANING PROCEDURE:
A REPLICATION AND EXTENSION

KEITH M. KILTY
UNIVERSITY OF ILLINOIS

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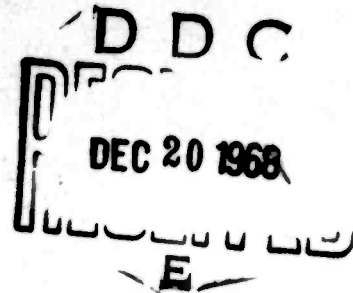
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Keith M. Kilty

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Abstract

This study was a replication and extension of an earlier one (Kilty, 1967), which compared the unidimensional (affect only) and the multidimensional (affect, cognition, and behavioral intentions) models of attitude structure, by using the implicative meaning (IM) procedure. According to the multidimensional model, this instrument is a measure of attitudinal cognition. The unidimensional model maintains the IM procedure is an indirect measure of affect. Thus, the unidimensional model predicts high correlations between IM scores and scores from an independent measure of affect, while the multidimensional model predicts relatively low correlations. The results, though, showed that by varying the type of concept, the type of belief, the number of beliefs, and the type of belief statement, significantly different levels of correlation could be obtained. The type of concept (e.g., abstract or concrete) appeared to be of most importance. In addition, widely different levels of correlation were found on the basis of method of correlation. The level was considerably higher when correlations were derived by subjects over concepts than by concepts over subjects.

Further Considerations of the Implicative Meaning Procedure:

A Replication and Extension[1]

Keith M. Kilty[2]

University of Illinois

For the past several decades, much of the research concerning attitude structure has stemmed from one of two theoretical orientations. From the first, attitude has been considered as a unidimensional construct, consisting solely of affect (e.g., Edwards, 1967; Fishbein, 1963, 1965; Osgood, Suci, & Tannenbaum, 1957; Thurstone, 1931). From the second, the multidimensional approach, attitude has been viewed as a three-component construct, consisting of affect, cognition, and behavioral intentions (e.g., Allport, 1935; Davis & Triandis, 1965; Katz & Stotland, 1959; Krech, Crutchfield, & Ballachey, 1962; Smith, Bruner, & White, 1956; Triandis, 1964, 1967).

The present study was a replication and extension of an earlier one (Kilty, 1967) which compared these two models by means of an attitude instrument, the implicative meaning (IM) procedure. This instrument was originally developed to measure the cognitive component of attitude (Davis & Triandis, 1967; Kilty, 1967; Triandis, 1967). Subjects were presented sentences in the form of "if, then" clauses, with the attitude objects in the "if" parts and related objects in the "then" parts (e.g., If one has FEAR,

then one has _flight_.). Probability ratings of the statements and evaluations
of the related objects were obtained, and IM scores were derived from
these ratings.

From the unidimensional orientation, this instrument is considered
an indirect measure of affect. Fishbein (1963), for example, has hypo-
thesized that the attitude or affect toward any object is a function of the
beliefs about the object and of the evaluative aspect of those beliefs;
i.e., $A_o = \sum_{i=1}^{N} B_i a_i$, where A_o is the attitude toward object "o," B_i is the
belief "i" about object "o," a_i is the evaluative aspect of B_i, and N is
the number of beliefs (p. 234).

As may be noted, the two methods are quite similar, although the two
theoretical formulations are opposite.

The results of the previous study (Kilty, 1967) were generally
consistent with the multidimensional formulation, but they were not entirely
unequivocal and presented some new problems. The first three hypotheses
below were replications of the preceding experiments, the last two endemic
to this study.

Hypotheses

Affect and cognition. According to the unidimensional approach
(Fishbein, 1963, 1965), scores from an independent measure of affect--in
this case, semantic differential (SD) evaluations, of the attitude objects--
and from the IM procedure should correlate highly, this correlation
approaching the level of the pooled reliabilities of the IM and affect
scales.

By contrast, the multidimensional model considers the IM procedure a
measure of attitudinal cognition that only overlaps somewhat with measures
of affect. Most multidimensional theorists and also the consistency theorists

(e.g., Festinger, 1957) specifically emphasize that, although a relationship between affect and cognition will typically be observed, the overlap in variance will be relatively low. As previously argued (Kilty, 1967), according to this view, overlap between IM scores and SD scores should account for no more than about 30% of the common variance -- or, in terms of a correlation, not exceeding a coefficient of, say, .55. Taking reliability into account reduces this correlation to an uncorrected coefficient of about .45.

In terms of a continuum of correlations. the unidimensional model would predict that the correlations between the affect and cognition measures, converted to z scores, should be normally distributed with an upper limit at $z = 1.0454$, $r = .78$, the upper limit of the pooled reliabilities of the relevant scales. According to the multidimensional approach, the correlations should be distributed with an upper limit at $z = 0.4847$, $r = .45$, the point representing 30% of the reliable common viriance.

Type of belief. Fishbein (1967) has maintained that all beliefs may be considered "indicants" of attitude, but only salient beliefs are "determinants." Salient beliefs are those that a subject himself holds toward an object -- which are not necessarily those that are supplied by a standard sort of attitude instrument (e.g., a Likert or Thurstone scale). The Fishbein (1967) model would predict that the correlations between IM scores and SD evaluations should be greater for scores based on free beliefs than for scores based on standard beliefs.

From the multidimensional viewpoint, however, it is hypothesized that the relationship between IM scores and SD evaluations should be decreased by using free beliefs (cf. Kilty, 1967).

In addition, as an independent measure of saliency, subjects were required to rate all beliefs on importance scales. Essentially, it was felt that the more salient is the belief the greater will be its importance, and, accordingly, it is hypothesized that free beliefs will be rated as more important than standard beliefs.

Number of beliefs. Fishbein (1967) has also hypothesized that a person's salient beliefs are structured in terms of a "ha 't-family-hierarchy" of beliefs, this hierarchy consisting of six to 11 beliefs at any given time. In line with the earlier study, this assumption was tested by comparing scores based on three and on six beliefs.

Type of belief statement. The belief statements used in previous studies have been limited to a single type (e.g., Davis & Triandis, 1965; Fishbein, 1963; Kilty, 1967; Rosenberg, 1956).

Most of these beliefs can generally be considered as consequential or implicative in nature. A belief statement, for instance, used by Fishbein, Landy, and Hatch (1965), characteristic of that study, was "My least preferred co-worker is incompetent (p. 17)." This may readily be transliterated into "If one has my least preferred co-worker, then one has incompetence."

The IM procedure led to the development of another instrument, the antecedent-consequent technique (Triandis, Kilty, Shanmugam, Tanaka, & Vassiliou, 1968), which also involves the elicitation of antecedent beliefs (e.g., If one has _____, then one has FEAR). Such beliefs are, in a sense, complementary to the consequent statements already used. Antecedent beliefs, however, do not necessarily elicit the same information, and, as a measure of attitudinal cognition, have already been shown to be effective in a cross-cultural study on the perception of the implicative

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relationships among a set of concepts (Triandis et al., 1968). Thus, it was felt that antecedent beliefs could be investigated as an independent type of belief statement.

According to Fishbein (1965), no difference should be found between correlations based on consequent beliefs and those derived from antecedent beliefs.

Type of concept. A re-analysis of some of the data of the previous study (Kilty, 1967) found a highly significant effect for the concepts (i.e., the correlations ranged widely across the 13 attitude objects), which was difficult to interpret in terms of that experiment. It seemed attributable either haphazardly to single objects, or, as more likely, to differential effects due to domains or types of concepts.

To explore this problem further, three a priori categories of concepts were established: (a) abstract concepts, (b) concrete issues, and (c) person concepts. Four concepts were chosen from each category -- also giving 12 concepts that had not been previously used. Throughout the series of experiments, a total of 25 concepts were employed.

Method

Subjects

A sample of 28 white males were pretested to obtain implicates for the questionnaire containing standard beliefs. Another sample of 43 white males responded to the free beliefs questionnaire, and a last sample of 43 white males to the standard beliefs instrument. All 114 subjects were from the University of Illinois Psychology 100 Subject Pool, serving in partial fulfillment of a course requirement.

Questionnaires and Procedure

Free beliefs questionnaire. The first questionnaire consisted of three parts, the 12 attitude objects (which may be seen in Table 1) in a fixed random order in all sections.

The first part was a modified form of the IM procedure, as used in the second experiment of Kilty (1967), in which consequent beliefs were elicited and rated. "If, then" sentences were presented to subjects, the stimulus concepts in the "if" parts, and the "then" parts blank. Six free beliefs were elicited per concept. Under each of the six blanks, beneath each sentence, were a probable-improbable scale and an important-unimportant scale. On the following sheet, the six blanks were repeated in the same positions but without the accompanying sentence. Beneath each of these blanks were a good-bad scale and an important-unimportant scale.

Two of each kind of sheet were stapled together, and the 12 pairs were administered with a sheet of carbon paper. The same responses, then, appeared on both sheets, but the implicates could be rated separately in the belief-statement form and in the evaluation of the associated object form, precisely following Fishbein's (1963) method.

In the second part, subjects rated the 12 concepts on nine SD scales (comprising three factors), which had been taken from previous work with the instrument (Davis, 1966; Kilty, 1967). The "evaluation" factor constituted the independent measure of affect.

Antecedent beliefs were elicited in the third section. The attitude objects, that is, were presented in the "then" part of the sentences, subjects completing the "if" part (e.g., If one has_____, then one has FEAR).

Table 1

Correlations between IM Scores and SD Evaluations for Type of Belief, Number of Beliefs, Type of Statement, and Type of Concept.

| | | FREE | | | | STANDARD | | | |
| | | Three | | Six | | Three | | Six | |
		CON	ANTE	CON	ANTE	CON	ANTE	CON	ANTE
Abstract	Fear	25	24	42	16	61	44	65	55
	Laughter	52	18	49	31	70	54	66	61
	Love	16	18	24	28	56	46	61	55
	Progress	29	29	40	18	68	38	70	56
	$\bar{X}_r$	31	22	39	23	64	46	66	57
Concrete	Civil Rights Demonstrations	55	32	53	39	71	-05	46	-28
	Striking by public employees	32	44	57	48	30	-08	41	-18
	Withdrawal from Vietnam	79	46	70	52	23	45	44	46
	Trade with Communist Countries	65	73	70	70	11	43	32	48
	$\bar{X}_r$	60	51	63	53	37	22	41	14
Person	H. Rap Brown	54	27	43	31	42	16	57	33
	Ho Chi Minh	61	58	58	60	-09	30	29	42
	Charles De Gaulle	52	33	38	34	30	51	45	52
	Lyndon B. Johnson	58	52	62	55	27	38	50	70
	$\bar{X}_r$	56	43	51	46	23	34	46	51
	Column $\bar{X}_r$	50	39	52	42	43	35	52	42

Note: Decimals have been omitted. $N = 43$; $r = .30$, $p < .05$; $r = .39$; $p < .01$.

Subjects again gave six responses, which they rated on the same scales as in part one. The only change in format, then, was in the placement of the stimulus concepts.

Scoring procedures were consistent with the results of Kilty (1967); the probability scale was scored 6 to 0 and the evaluative scale from +3 to -3. IM scores were computed according to Fishbein's (1963) method.

Standard beliefs questionnaire. The second questionnaire differed only in that subjects were supplied with the completed beliefs. The only change in format was that the six blanks were completed, needing to be rated only.

For the four abstract concepts, the implicates were obtained from data collected by Triandis et al.(1968); responses for the other eight concepts were obtained from a small pre-test sample.

Results

Affect and Cognition

The first hypothesis concerning the relationship between the two instruments was tested by correlating IM scores and SD evaluations, a replication of the two preceding tests (Kilty,1967).

As may be seen in Table 1, the range of the correlations was quite wide, from -.28 to .79--similar to the previous results. Columns 1, 3, 5, and 7 in Table 1 specifically replicate Experiment II in Kilty (1967), except for a different sample of attitude objects. In the previous experiments, abstract concepts primarily were used, and, for this reason, the first four rows should be viewed most closely in terms of the replication.

For the free beliefs, only two of the eight correlations exceeded
the criterion of .45, which would control 30% of the reliable common vari-
ance. Both mean coefficients were below this level (.31 and .39),
closely resembling the previous results. All corr....tions for the stan-
dard beliefs, however, exceeded the criterion. For all 12 concepts,
only 21 correlations (44%) were within the criterion, and three of the
means exceeded it. These results were considerably different than those
found earlier, where, overall, 70% of the correlations were within the
criterial level and no mean coefficient exceeded it (Kilty, 1967).

For the whole table, 49 of the correlations (51%) were within the
criterion, as were five of the eight means, quite inconsistent with the
previous results. This is especially so since most of the correlations
that were within the criterion were for the antecedent beliefs, which
had not been employed in the earlier study.

Beliefs and Concepts

To test the four hypotheses concerning (a) type of belief, (b) type
of concept, (c) number of beliefs, and (d) type of statement, a 2 x 3 x
2 x 2 analysis of variance with repeated measures over the last two fac-
tors was run over the data (after conversion to z scores) of Table 1,
the results of which are presented in Table 2.

Two significant main effects were obtained. That for the number
of beliefs ($F = 7.48$, $df = 1$, 18, $p < .05$), was also involved in a
second-order interaction. Discussion will be deferred for the moment.

The second effect, the type of statement ($F = 5.07$, $df = 1$, 18,
$p < .05$), showed that, in terms of highest correlation with criterion, the
consequent statements outperformed the antecedents (overall means of

Table 2

Summary of Analysis of Variance over the Correlations between
IM Scores and SD Evaluations

Source	df	MS	F
Between			
Type of Belief (A)	1	3,543,938	< 1
Type of Concept (B)	2	210,361	< 1
A X B	2	111,097,920	17.17***
Error (w)	18	6,471,040	
Within			
Number of Beliefs (C)	1	9,507,338	7.48*
A X C	1	3,828,408	3.01
B X C	2	1,545,996	1.22
A X B X C	2	4,744,273	3.73*
$Error_1$	18	1,270,434	
Type of Statement (D)	1	37,621,346	5.07*
A X D	1	159,334	< 1
B X D	2	7,434,104	1.02
A x B X D	2	5,724,344	< 1
$Error_2$	18	7,417,399	
C X D	1	9,943	< 1
A X C X D	1	78,947	< 1
B X C X D	2	482,541	< 1
A X B X C X D	2	1,965,966	2.43
$Errors_3$	18	807,551	

*$p < .05$

***$p < .001$

.49 and .39 respectively). This result failed to substantiate the ex-
pectation derived from Fishbein (1965) that no difference would be found
between different kinds of belief-statements.

The first order interaction between type of belief and type of con-
cept was highly significant (F = 17.17, df = 2, 18, p ⟨.001). Interpret-
ing again in terms of correlation with criterion, standard beliefs gave
the highest correlations for abstract concepts, while free beliefs gave
the best for both concrete issues and person concepts. This "best" cor-
relation, however, is relative, in that the means for the abstract and
concrete concepts (with the relevant type of belief) were .59 and .57
respectively, while for the person concepts it was .49.

This interaction, however, must also be viewed in light of the
significant triple interaction involving type of belief, type of con-
cept, and number of beliefs (F = 3.73, df = 2, 18, p $<$ .05). The general
pattern of means substantiated that previously discussed for the inter-
action between belief and concept types. The effects of the number of
beliefs, though, is not quite so clear as the simple main order effect
would imply. For the abstract and concrete concepts, using six beliefs
gave the highest correlation--although the differences between three
and six beliefs were relatively small. For the person concepts, three
beliefs slightly outperformed six for the free beliefs; in addition,
using six standard beliefs gave as good a correlation with criterion as
did six free beliefs. In only this last instance, then, did a considera-
tion of the number of beliefs become important.

Overall, six beliefs were generally slightly better than three--
but usually nonsignificantly so, giving relatively little support to

Fishbein's (1967) hypothesis concerning the number of beliefs, the same results as found earlier (Kilty, 1967).

The hypothesis concerning free vs. standard beliefs was also not fully supported in terms of either model. The type of belief giving the best or worst correlation with criterion appears highly dependent on the type of concept, and, for the person concepts, the number of belefs also appears to be important.

Saliency as the Degree of Importance

As in Experiment II of the previous study (Kilty, 1967), importance ratings were obtained for all belief statements. The six such ratings for each concept were then summated, and $\underline{t}$ tests were performed between the free and standard beliefs. According to the hypothesis, free beliefs--whether consequent or antecedent statements--should be considered more important (salient) than the standard beliefs.

The hypothesis was not supported. For the antecedents, only one $\underline{t}$ test (one-tailed) was significant (for TRADE WITH COMMUNIST COUNTRIES), and it was in the direction opposite to that predicted ($\underline{t}$ = -2.14, $\underline{df}$ = 84, $p < .01$). Similar results were obtained for the consequent beliefs. There were five significant tests, only three of which supported the hypothesis (FEAR, $\underline{t}$ = 2.99, $\underline{df}$ = 84, $p < .001$; CIVIL RIGHTS DEMONSTRATIONS, $\underline{t}$ = 2.04, $\underline{df}$ = 84, $p < .05$; WITHDRAWAL FROM VIETNAM, $\underline{t}$ = 2.48, $\underline{df}$ = 84, $p < .01$). The results for LAUGHTER ($\underline{t}$ = -1.81, $\underline{df}$ = 84, p .05) and for H. RAP BROWN ($\underline{t}$ = -1.87, $\underline{df}$ = 84, $p < .05$) were counter to the hypothesis.

There was a difference between the present tests and those reported in Kilty (1967), in that ratings on both sorts of beliefs were made by the same subjects before and those in the present experiment

by two different samples. In terms of Fishbein's (1967) hypothesis,
though, this should make little or no difference, and, as may be re-
called, the hypothesis was previously only weakly supported.

Discussion

The present study would appear to have posed more questions than it
set out to answer. The replication itself, to begin with, was by no means
successful. The average level of correlation between IM scores and
SD evaluations was considerably higher throughout the present study than
had been found previously (Kilty, 1967); only about half the correlations
were less than the criterion of .45.

The previous two experiments, however, may well be conceptualized as
fitting into only a small part of the present factorial design. The
types of beliefs and the numbers of beliefs were the same, but only con-
sequents had been employed before, and the main type of attitude objects
had been abstract concepts. When viewed in this light, the replication
does appear more successful--at least in the general pattern of results.
The level of correlation was still higher presently, but the free be-
liefs were inferior to the standard (in line with the multidimensional
hypothesis). In the present experiment, however, there was more of a
difference (still nonsignificant) between the number of beliefs for the
free beliefs.

The overall results were not fully supportive of either position--
but were especially unfavorable toward Fishbein's (1967) behavior theory
approach to attitude acquisition and structure. A significant differ-
ence was found between the types of belief statements, and the three-
way interaction between type of belief, number of beliefs, and type of

concept severely limits the generality of his model--regardless of the
degree of correlation between the two attitude instruments. The inde-
pendent test of saliency (the importance ratings) found no consistent
support for an assumption that either type of belief (free or standard)
is necessarily more salient than the other. Simply assuming that free
beliefs are more salient than standard was also not supported by the
correlations.

The results were far more complicated than Fishbein's hypotheses
can tolerate--far more complicated, too, than for the simple hypotheses
that were derived from the multidimensional approach. It may be recalled
that all hypotheses were stated in terms of simple main order effects--
none as interactions. The present data would seem to indicate that the
variables under consideration vary--alone or together--in a much more
complex fashion than has been thought.

The variables per se, for that matter, were not drastically dif-
ferent--really only minor changes, it would appear, in format. Yet
these minor changes in format produced quite striking differences.

Of major inportance would seem to be the type of concept. Two of
the three other variables were involved in interactions with it, only
the type of statement giving clear and consistent results independent
of concept type. When the concepts were treated as an independent fac-
tor in the previous study, as discussed earlier, a significant effect was
obtained. Although most of those concepts were abstract, the range was
still extensive. Within given types and not considering across types,
the range was extensive in this study, too (see Table 1), which could
well indicate that the present classification was quite rough.

This "concepts" effect is quite analogous to what has been found for task characteristics and group productivity (e.g., Hackman, 1968), an effect that has been considered in attitude research only in regard to factor analyses of SD scales (e.g., Osgood et al., 1957) and behavioral differential scales (e.g., Triandis, 1967). The effect is also much more difficult for models such as Fishbein's (1965, 1967) to cope with than for multidimensional models (e.g., Triandis, 1967).

Fishbein's (1963) equation, in particular, was presented in terms of any attitude object, but the present results greatly restrict such generality. For the multidimensional model, this sort of limitation is not quite so severe. Here attitude is conceptualized as having a number of components which may or may not overlap. New information can still be obtained by measuring more than one dimension, and this may be of considerable importance when attitudes are being measured to predict some criterion (e.g., Davis and Triandis, 1965) or to obtain a general picture of an individual or a sample (e.g., Smith et al., 1956).

Davis and Triandis (1965), for example, used measures of several components of attitude in order to predict the outcomes of negotiations between blacks and whites. They employed multiple regression techniques, and the resulting equations, of course, took into account the overlap between the instruments. As Davis and Triandis showed, the correlations with criterion for the measures independently were not as high as for the combined measures.

The present results, then, appear most limiting for unidimensional models, especially so for models such as Fishbein's (1963) which assume that no differential effects due to individual concepts or to types of concepts will occur.

Looking again at the Fishbein (1963) model produces another sort of analysis. His model also assumes a "general subject;" i.e., subjects responding in a similar, consistent way. This, again, has been a neglected aspect of attitude research. Will the same effects occur if scores from the two instruments are correlated over concepts rather than over subjects?

Consistency within Subjects

The following analysis also illustrates another generally neglected aspect of the present sort of attitude research. The present data involved three modes (subjects, rating scales, and concepts), of which only two modes were used in the analyses. As done in this paper (and in most of the research reviewed), the "subjects" mode was collapsed, and correlations between IM and SD scores were computed over subjects by concept. What follows was the reverse of this procedure: Correlations were computed over concepts by subject, in effect an analysis of the internal consistency of the subjects.

The hypotheses that have been presented ʍ ˟till amenable to test in essentially the same manner as before. The only information lost concerned the concepts factor.

In addition to the present data, those for Experiment II of the Kilty (1967) study were available for this analysis, and these will be presented first.

Correlations by Subject for the Previous Study

In Table 3 are given the cell means for these correlations. As may be readily seen, the average level of correlation was quite high, in all cases controlling over 50% of the common variance.

Although the correlations were based on only an N of 13, all the means were significant at beyond the .01 level, which speaks in favor of their stability and actuality and against their being merely a statistical artifact.

These results were also in sharp contradiction to those found before by correlating by concept, which are given in parentheses in the appropriate cells in Table 3.

A 2 X 2 analysis of variance was conducted over these data (after z transformation) to test the hypotheses concerning type and number of beliefs. No significant effects were obtained, failing to substantiate either of Fishbein's (1967) hypotheses. This was also a failure to replicate the previously obtained effect for the type of belief, where standard beliefs had been found to outperform the free (Kilty, 1967).

It would appear that, for at least these data, correlating by subject produced markedly different results from those obtained by correlating by concept.

Correlations by Subject for the Present Study

The mean correlations by subject for the present study are given in Table 4 (with the mean correlations by concept repeated in parentheses). The same effect as before may be observed; i.e., an overall increase in the level of correlation. This increase, though, was not as marked as for the data just presented, only half the correlations now significant at beyond the .01 level. The other four correlations were significant at the .05 level, and the antecedent belief statements accounted for three of these means. Again, in terms of correlation with criterion, the antecedents did not perform as well as the consequents.

Table 3

Cell means for Correlations between IM Scores and SD Evaluations by Subject for Kilty (1967) study.

	Free	Standard
Three	.74	.73
	(.30)	(.42)
Six	.75	.78
	(.30)	(.41)

Note: $N = 13$; $r = .55$, $p < .05$; $r = .08$, $p < .01$.
Correlations in paratheses are those for correlations-by-concept analysis.

Table 4

Cell Means for Correlations between IM Scores and SD Evaluations by subject for Present Study.

			Free	Standard
Three	Con		.74	.66
			(.50)	(.43)
	Ante		.67	.60
			(.39)	(.35)
Six	Con		.76	.76
			(.52)	(.52)
	Ante		.70	.66
			(.42)	(.42)

Note: N = 12; r = .58, p ⏤.95; r = .71, p < .01.
Correlations in parentheses are those for correlations-by-concept analysis.

In order to test the hypotheses concerning (a) type of belief, (b) number of beliefs, and (c) type of statement, a 2 X 2 X 2 analysis of variance with repeated measures over the last two factors was performed on the z-converted correlation coefficients. This again was also a test of the degree of difference in results between the two methods of correlation. The results are shown in Table 5.

No main effect was obtained for the type of belief, a further failure to support any proposition that one type of belief is necessarily more salient than the other. There was a significant main effect for the number of beliefs ($F = 38.26$, $df = 1, 84$, $p < .001$), which supported Fishbein's (1967) hypothesis. Also for the type of statement ($F = 19.19$, $df = 1, 84$, $p < .001$), there was a significant effect, the consequents giving higher correlations with criterion.

Both factors, though, were involved in higher order interactions. The interaction between type of belief and nember of beliefs ($F = 9.79$, $df = 1, 84$, $p < .01$) would indicate that if only three beliefs are used, free beliefs result in higher correlations between the instruments. When six beliefs are employed, the correlations are nearly the same and only a slight improvement over three free beliefs.

There was also a significant three- way interaction ($F = 4.05$, $df = 1, 84$, $p < .05$). In general, the results were similar to those for the interaction between type and number of beliefs. The belief statement factor seems to have become involved primarily because the correlations for free and standard beliefs were identical when six consequents were used. Elsewhere, the standard beliefs were inferior to the free and also the antecedents to the consequents in a fairly consistent pattern.

Table 5

Summary of Analysis of Variance for Correlations by Subject
on Present Data.

Source	df	MS	F
Between Subjects			
Type of Belief (A)	1	55,520,229	1.67
Error (w)	84	33,263,589	
Within Subjects			
Number of Beliefs (B)	1	80,327,721	38.26***
A X B	1	29,556,092	9.79**
$Error_1$	84	2,099,562	
Type of Statement (C)	1	180,526,500	19.19***
A X C	1	568,228	1
$Error_2$	84	9,031,736	
B X C	1	2,466,910	1.52
A X B X C	1	6,553,060	4.05*
$Errors_3$	84	1,618,323	

*p < .05
**p < .01
***p < .001

As before, the hypotheses were not clearly supported. The number of beliefs factor was significant in the direction predicted by Fishbein (1967), but not straightforwardly so when type of belief and type of statement were taken into account.

For the present experiment, though, the general pattern of results was rather similar for the two methods of correlation. The basic difference was in the degree of correlation, all means well beyond the criterion level of .45.

The results obtained from the data from the preceding study (Kilty, 1967) again may be dependent partly on the concepts employed. An inspection of the cell means indicates the same trends. The concepts there used only part of the range employed in the present study, and this may well be the reason that no significant effects were obtained from that analysis of variance.

Implications and Conclusion

The present study set out to compare two models of attitude struc- ture which are generally considered to be mutually exclusive by an investigation of the properties of the IM procedure. The results, though, were not consistently favorable toward either approach. It would appear that, at least partially, this was due to the two models not being mutually exclusive.

A perhaps facetious examination of the results in Tables 1 and 2 could point out the techniques necessary to support either model. With a careful consideration of the type of belief, type of concept, number of beliefs, and type of statement--if not other factors--one can easily support either model. An additional consideration of correlational techniques can also result in support of the appropriate model.

This is not to say that the present study simply showed that results can be artifactually produced. Although several of the issues raised here have generally been neglected, the present results do point out their considerable importance.

The type of concept, as discussed, is a major factor, and this seems to have extended into the correlations-by-subject-over-concepts analysis, as evidenced by the data from the earlier experiment. The more homogeneous the sample of attitude objects, the more similar the correlations under the various experimental conditions.

A note of caution concerning the type of concepts effect should be sounded here, too. As mentioned, effects were obtained for this factor, but the within-type variance was also at times rather large. This was especially true for the earlier data. The a priori classification should be viewed as only a rough measure. There are a wide variety of other types of concepts which have yet to be explored in this manner. Further research is clearly needed here.

To reiterate briefly, these effects are most damaging to models such as that of Fishbein (1963, 1965). This is also without regard to the actual level of correlation, whether or not within the criterion level of .45. Such models must necessarily assume a "general attitude object." The effects for type of belief statement, too, are quite serious for such models. The effect of such a simple transposition of an element within a sentence from one part to another greatly restricts the model's generality. Perhaps what is needed here is a linguistic analysis of the experimental factors.

The analyses just presented raise a further issue--one that would
seem to be simply a methodological or statistical problem but one that
vastly changes the results. As has been shown, the level of correla-
tion can be manipulated by the method of correlation; i.e., correlating by
subject or by concept.

Most previous attitude research has used the method employed in the
earlier part of this paper. Yet the present results raise serious questions
concerning the method to use. Part of the difficulty, of course is in-
volved in obtaining measures of enough attitude objects. The largest
number used at one time in this study was 13. Because of this small N,
the results should be viewed carefully, as possibly a statistical artifact.
Fortunately, the correlations were generally significant beyond the .05
level, most at the .01 level. Only a small percentage of the correlations
were nonsignifica ., and, in the case of the present experiment, most
of these were for the antecedent belief statements. It would still be
best, though, to replicate the study using at least 30 attitude objects.

The issue as to which method of correlation to use is still pre-
sent. In Table 6 are presented some hypothetical data that may help to
clarify the issue. It may be seen that each of the five subjects is
completely consistent across all observations for the two instruments; i.e.,
the rank orders are identical, and the correlations would be 1.0. But when
these data are viewed in terms of correlation by concepts over subjects,
the results are quite dissimilar. The rank orders shift inconsistently,
and, of course, the level of correlation is markedly reduced.

Internally, the hypothetical subjects in Table 6 are highly consistent
between their affect and cognition scores, which is not reflected in an
analysis by concepts. For the type of data used in this paper, the second

Table 6

Hypothetical Data Illustrating the Differences in Level of
Correlation between the Two Methods

Ss	1		2		3		4		5	
Concepts	IM	SD	IM	SD	IM	SD	IM	SD	IM	SD
1	1	2	1	3	7	8	1	66	2	4
2	2	3	2	4	6	7	2	7	1	2
3	3	4	2	4	6	7	3	8	3	5
4	1	2	3	5	4	5	4	9	1	2
5	4	5	5	8	7	8	1	6	5	8
r	1.0		1.0		1.0		1.0		1.0	

method of correlation would seem to be the better for a comparison of the two models. This method, it should be noted, still failed to substantiate Fishbein's (1967) behavior theory approach to attitude structure. It did support his general consistency model (Fishbein, 1963) and related theories (e.g., Rosenberg, 1956).

The other issues also remain, as evidenced by the analysis of variance in Table 5, and, as discussed above, the concepts factor appears to remain of considerable importance regardless of the method of correlation.

It could, of course, be argued that statistical techniques that take into account all three modes of the data simultaneously are needed. Such procedures would eliminate these correlational problems.

A possible way of solving part of this problem presently would be to use the IM procedure simply as a measure of cognition or using only the probability ratings. When the evaluations of the implicates are taken into account, the instrument is no longer a measure simply of attitudinal cognition. For research such as Davis and Triandis' (1965), this would seem to be the best procedure.

In any event, the present results were much more complex than has generally been assumed to be the case with research concerning attitude theory and structure. Attitude theory and research methodology are extremely intertwined (cf. Triandis, 1967, pp. 227-229), and any resolution of these issues must take this fact into account.

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13. ABSTRACT

This study was a replication and extension of an earlier one (Kilty, 1967), which compared the unidimensional (affect only) and the multi-dimensional (affect, cognition, and behavioral intentions) models of attitude structure, by using the implicative meaning (IM) procedure. According to the multidimensional model, thisinstrument is a measure of attitudinal cognition. The unidimensional model maintains the IM procedure is an indirect measure of affect. Thus, the unidimensional model predicts high correlations between IM scores and scores from an independent measureof affect, while the multidimensional model predicts relatively low correlations. The results, though, showed that by varying the type of concept, the type of belief, the number of beliefs, and the type of belief statement, significantly different levels of correlation could be obtained. The type of concept (e.g., abstract or concrete) appeared to be of most importance. In addition, widely different levels of correlationwere found on the basis of method of correlation. The level was considerably higher when correlations were derived by subjects over concepts than by concepts over subjects.

14. KEY WORDS

attitude
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multidimensional model
implicative meaning (IM)
implicate
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